



**Western
Massachusetts
Electric**

100 Summer Street, 23rd Floor
Boston, Massachusetts 02110-2131
(617) 345-1066
Fax: (617) 345-1148
E-mail: klionsh@nu.com

Stephen Klionsky, Esq.

September 22, 2005

Ms. Mary L. Cottrell
Secretary
Dept. of Telecommunications & Energy
One South Station
Boston, MA 02110

Re: Docket No. DTE 04-116 - Investigation into Quality of Service Provided by LDC's

Dear Ms. Cottrell:

This letter provides the response to requests for the information listed below.

Response to HD-01 Interrogatories dated 09/09/2005

RR – 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012

Very truly yours,

Stephen Klionsky

SK/jms
cc: Service List

Western Massachusetts Electric Company
Docket No. DTE 04-116

Record Request HD-01
Dated: 09/09/2005
Q- RR-001
Page 1 of 3

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Provide a copy of the Service Quality Report Card mailed to customers in July 2005.

Response:

Attached please find WMECO's Service Quality Report Card mailed to customers in July 2005.

Western Massachusetts Electric Company
Docket No. DTE 04-116

Record Request HD-01
Dated: 09/09/2005
Q- RR-002
Page 1 of 1

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

For Constellation NewEnergy, provide the information on those other states or jurisdictions which have made market-access services a service-quality measure or standard.

Response:

This question is not applicable to WMECO.

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Provide an analysis which compares penalties and offsets under the filed SQI as opposed to the IEEE method.

Response:

Provided below is an analysis of WMECO SAIDI and SAIFI reliability data for the years 2000 through 2004, comparing the present DTE Reporting criteria against the IEEE 1366 Reporting methodology. IEEE results are shown using both a Company, and a Company/Division exclusion trigger. It can be seen from the results that use of the IEEE standard produces a much smaller standard deviation, making the bandwidth to incur penalties significantly less. Even so, if the present standard deviation penalty calculations were to be applied, WMECO would have incurred a penalty in 2002 regardless of the methodology utilized.

Summary of SAIDI/SAIFI for 2000-2004

Criteria Utilized	SAIDI		SAIFI	
	Average	Standard Deviation	Average	Standard Deviation
DTE Reporting	140.11	29.59	0.992	0.149
IEEE Reporting - Co Excl	98.16	12.15	0.918	0.119
IEEE Reporting - Co/Div Excl	97.28	10.99	0.913	0.110

Penalty and Offset Comparisons

DTE Reporting Criteria - Company Exclusions						
Year	SAIDI			SAIFI		
	Observed	Formula Results	Penalty or Offset	Observed	Formula Results	Penalty or Offset
2000	139.37	0.00	None	0.928	0.05	None
2001	101.44	0.43	Offset	0.842	0.25	Offset
2002	166.16	0.19	None	1.223	0.60	Penalty
2003	171.68	0.28	Penalty	1.050	0.04	None
2004	121.91	0.09	None	0.917	0.06	None

IEEE 1366 Reporting Criteria - Company Exclusions

Year	SAIDI			SAIFI		
	Observed	Formula Results	Penalty or Offset	Observed	Formula Results	Penalty or Offset
2000	96.61	0.00	None	0.853	0.07	None
2001	81.89	0.45	Offset	0.798	0.25	None
2002	112.10	0.33	Penalty	1.111	0.66	Penalty
2003	92.29	0.06	None	0.893	0.01	None
2004	107.89	0.16	None	0.935	0.01	None

IEEE 1366 Reporting Criteria - Company/Division Exclusions

Year	SAIDI			SAIFI		
	Observed	Formula Results	Penalty or Offset	Observed	Formula Results	Penalty or Offset
2000	96.61	0.00	None	0.853	0.08	None
2001	81.89	0.49	Offset	0.798	0.28	Offset
2002	107.71	0.23	None	1.088	0.63	Penalty
2003	92.29	0.05	None	0.893	0.01	None
2004	107.89	0.23	None	0.935	0.01	None

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Provide an analysis if the momentary-outage standard is changed from one minute, or less than one minute, to five minutes. What would be the impact?

Response:

WMECO does not have the ability to record momentary outages of less than one minute duration. The actual effect of applying the IEEE 1366 duration standard of greater than five minutes duration, versus current DTE criteria of greater than or equal to one minute, is absolutely negligible. The real difference is in the event selection and what presently is excluded in the DTE Reporting Methodology, opposed to adoption of the IEEE 1366 Standard which has the five minute outage duration criteria.

The following analysis, performed for the years 2000 through 2004, demonstrates the effect of excluding events presently not reported under DTE Reporting criteria. WMECO believes that the present method of excluding certain outages based on cause or equipment type is camouflaging the actual experience of customers. These extra exclusions are dependent on the design of the reporting system for each company and thus there may be an inconsistency of application resulting in deviations of reporting among the companies. Specifically for WMECO, the implementation of EDS introduced a Device Name attribute which was not available in TCIAS2. Part of the device name is the Device Type. Attached as Appendix A below is a document defining, for WMECO, how the DTE Reporting requirements has been translated into specific computer code applicable to its TCIAS2 outage management system. The introduction of the EDS outage management system has required some modifications to the computer code due to the change in system design and additional information available in the system.

The table below provides an explanation of the columns included in the analysis represented by Appendix B, below. Appendix B contains five tabs, one for each of the years 2000 to 2004. The analysis shows by year the number of events, customers affected, customer minutes, and SAIDI excluded, by cause type under current methodology. The analysis shows that under the IEEE 1366 Standard, there is very little exclusion from the causes listed.

Column	Comments
Included In Reporting	This document presents an analysis of the years 2000 through 2004 comparing the differences between 1366 reporting criteria. This analysis includes the effect of all events regardless if they would have qualified under 1366 reporting exclusion rules. Thus there is a level comparison between the methods.
DTE Reporting Exclusion Criteria	Would an event be selected under either the DTE reporting rules or the IEEE 1366 reporting rules The "X" indicates the reason for exclusion under the DTE reporting rules. The column headings are based on the reporting system, and the way selected attributes were combined to reflect the DTE exclusion criteria
Average Customers Served	The average customers served for the year - based on the month ending customer counts.
Trouble Spot Count	The number of events / repair locations
Customers Affected	The number of customers affected from all events
Customer Minutes	The total customer minutes
SAIDI	Calculated as Customer Minutes/Average Customers Served
Summary	Totals for the detail information presented above.

Massachusetts DTE Revised Reliability Reporting Requirements

The following table explains the steps used to process the data and discusses the methods employed in that step

Processing Step

Discussion

Criteria For Data Selection

- The data selection was done at the trouble spot level since TC2 does not store the required indicative data at the interruption level.
- To be selected, the trouble spot must have at least 1 affected customer and at least 1 minute of duration.
- If the Classification of Origin code had a value of CEBU (Customer Equipment), the trouble spot was not selected per paragraph V. A. on page 7 of the DTE Order.
- If the Cause code had a value of CONV, APCH, OPER, or RLCN (Conversion, Apparatus Change Out, Operation/Maintenance, Relocation/Extension), the trouble spot was not selected as it was assumed that the root cause was a "Planned Outage" which is excludable per paragraph V. B. on page 7 of the DTE order.
- If the Cause code had a value of EXTL (External to the NU System) the trouble spot was not selected per the definition of "Excludable Major Event" on page 2 of the DTE order.
- If the Voltage Code was .120, .208, .277, .480, or .600, the trouble spot was not selected per V. G. on page 8 of the DTE order.
- If the Equipment Involved Code had a value of CONS (Conductor Secondary), the trouble spot was not selected per V. G. on page 8 of the DTE order.
- If the Conductor Type Code had a value of SECD or SERV (Secondary or Service), the trouble spot was not selected per V. G. on page 8 of the DTE order.
- If the Equipment Type Code had a value of TSBK, or TFSE (Transformer Breaker, Transformer Fuse), the trouble spot was not selected per V. G. on page 8 of the DTE order.
- If the Cause code was OVLD (Overload) and there was at least one customer affected and there was at least one minute of duration, the trouble spot was forced to be selected regardless of the foregoing as it was assumed that the root cause heat which is specifically not excludable per the definition of "Excludable Major Event" on page 2 of the DTE order.

Customers Served

The prior year average of the customers served was used to drive the calculation of the percent of customers affected for the test year

Customers Affected

The total number of customers affected for each day of the year was used to evaluate if an excludable event had occurred. This was calculated by adding up the customers affected on each trouble spot that was active on each day. Thus if the customers on a trouble spot lost power on day 1 and were not restored until day 3, those customers contributed to the customer totals for day 1, day 2, and day 3. In applying this calculation, all trouble spots with a cause of overload were backed out per the DTE order.

The 15% Rule

The active trouble spots were summed by day for each area work center and for total WMECO. This daily total was compared to the total customers served base. If the customers affected was \Rightarrow 15% of that base, the information was written to a report so that the limits of the excludable event could be determined

Excludable Event Limit

The limits of an excludable event have been defined as those contiguous days around the excludable day(s) when at least 1% of the customers are affected (from 1% affected until 99% restored). A broad range of days was defined around each 15% day and the customers affected tested using a 1% rule. The daily total customers affected was compared to the customers served base. If the customers affected was \Rightarrow 1% of the base, the information was written to a report so that the limits of the excludable event could be defined.

Identify Contributing Interruptions

Applying the limits defined above, all of the interruptions contributing to that period were identified to be used as the driver to exclude data from the calculation of the Reliability Indices.

Revised Reliability Calculations

The program used to validate the Goals Progress Report was modified to use the revised data selection criteria and the new method of defining an excludable event.

DTE and IEEE Reporting - Event Exclusion / Inclusion Comparison
Year 2000

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Included In Reporting		DTE Reporting Exclusion Criteria							Average Customers Served ==> 209,288			
DTE	IEEE	Duration < 1 Minute	Customer Equipment / Generation	External/Planned Outage	Secondary Voltage	Transformer Fuse or Breaker	Secondary	Secondary or Service	Trouble Spot Count	Customers Affected	Customer Minutes	SAIDI
N	Y							X	10	85	15,282	0.07
N	Y						X		16	213	13,445	0.06
N	Y						X	X	15	32	6,505	0.03
N	Y					X			66	493	132,147	0.63
N	Y					X		X	19	359	115,709	0.55
N	Y					X	X		1	2	152	0.00
N	Y					X	X	X	8	22	2,679	0.01
N	Y				X				26	303	70,723	0.34
N	Y				X			X	16	36	4,678	0.02
N	Y				X		X		15	21	4,703	0.02
N	Y				X		X	X	117	273	61,384	0.29
N	Y				X	X			47	121	21,337	0.10
N	Y				X	X		X	48	186	37,008	0.18
N	Y				X	X	X		11	29	6,560	0.03
N	Y				X	X	X	X	57	240	76,923	0.37
N	Y			X					28	4,010	194,385	0.93
N	Y			X			X		2	18	6,660	0.03
N	Y			X		X	X	X	1	3	447	0.00
N	Y			X	X			X	1	5	225	0.00
N	Y			X	X	X			1	2	446	0.00
N	Y			X	X	X	X	X	1	3	144	0.00
N	Y		X						2	2	167	0.00
N	Y		X					X	1	1	278	0.00
N	Y		X				X		1	5	3,750	0.02
N	Y		X		X				1	1	36	0.00
N	Y		X		X			X	1	1	27	0.00
N	Y		X	X					1	1	144	0.00
N	Y		X	X				X	1	27	36,936	0.18
Y	N								11	1,840	5,299	0.03
Summary									514	6,494	812,880	3.88
Excluded from DTE Reporting ==>									11	1,840	5,299	0.03
Excluded from IEEE Reporting ==>												

DTE and IEEE Reporting - Event Exclusion / Inclusion Comparison
Year 2001

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Included In Reporting		DTE Reporting Exclusion Criteria							Average Customers Served = => 210,539			
DTE	IEEE	Duration < 1 Minute	Customer Equipment / Generation	External/ Planned Outage	Secondary Voltage	Transformer Fuse or Breaker	Secondary	Secondary or Service	Trouble Spot Count	Customers Affected	Customer Minutes	SAIDI
N	Y							X	6	29	5,600	0.03
N	Y						X		17	1,183	171,274	0.81
N	Y						X	X	9	583	131,704	0.63
N	Y					X			63	345	61,505	0.29
N	Y					X		X	24	114	20,943	0.10
N	Y					X	X		2	75	23,425	0.11
N	Y					X	X	X	3	11	3,157	0.01
N	Y				X				26	130	23,561	0.11
N	Y				X			X	14	19	2,723	0.01
N	Y				X		X		21	54	8,744	0.04
N	Y				X		X	X	99	181	30,865	0.15
N	Y				X	X			42	154	29,816	0.14
N	Y				X	X		X	101	749	167,371	0.79
N	Y				X	X	X		2	10	1,190	0.01
N	Y				X	X	X	X	44	159	35,139	0.17
N	Y			X					35	4,539	303,157	1.44
N	Y			X		X			2	2	196	0.00
N	Y			X		X		X	2	6	316	0.00
N	Y			X		X	X	X	2	11	890	0.00
N	Y			X	X	X			1	5	150	0.00
N	Y			X	X	X		X	2	7	392	0.00
N	Y			X	X	X	X	X	5	15	299	0.00
N	Y		X						2	2	46	0.00
N	Y		X					X	1	5	5,025	0.02
N	Y		X		X				2	2	323	0.00
N	Y		X		X			X	1	1	106	0.00
Y	N								10	4,956	13,344	0.06
Summary									538	13,347	1,041,261	4.95
Excluded from DTE Reporting = =>									10	4,956	13,344	0
Excluded from IEEE Reporting = =>												

DTE and IEEE Reporting - Event Exclusion / Inclusion Comparison
Year 2002

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Included In Reporting		DTE Reporting Exclusion Criteria							Average Customers Served = => 211,625			
DTE	IEEE	Duration < 1 Minute	Customer Equipment / Generation	External/Planned Outage	Secondary Voltage	Transformer Fuse or Breaker	Secondary	Secondary or Service	Trouble Spot Count	Customers Affected	Customer Minutes	SAIDI
N	Y							X	13	2,190	526,477	2.49
N	Y						X		35	769	498,011	2.35
N	Y						X	X	6	27	17,793	0.08
N	Y					X			14	1,289	175,194	0.83
N	Y					X		X	6	28	5,334	0.03
N	Y				X				92	317	94,064	0.44
N	Y				X			X	43	86	13,504	0.06
N	Y				X		X		66	142	62,396	0.29
N	Y				X		X	X	189	392	84,511	0.40
N	Y				X	X			116	494	116,212	0.55
N	Y				X	X		X	60	196	37,924	0.18
N	Y				X	X	X		9	45	4,543	0.02
N	Y				X	X	X	X	52	112	17,753	0.08
N	Y			X					157	34,694	1,813,635	8.57
N	Y			X			X	X	1	82	820	0.00
N	Y			X		X			1	1	162	0.00
N	Y			X	X				3	16	379	0.00
N	Y			X	X			X	1	5	80	0.00
N	Y			X	X		X	X	2	6	165	0.00
N	Y			X	X	X			11	50	4,508	0.02
N	Y			X	X	X		X	6	26	741	0.00
N	Y			X	X	X	X		2	16	169	0.00
N	Y			X	X	X	X	X	3	11	911	0.00
N	Y		X						1	2	44	0.00
N	Y		X		X				4	8	6,125	0.03
N	Y		X		X			X	2	2	102	0.00
N	Y		X		X		X	X	2	2	49	0.00
N	Y		X		X	X			1	2	176	0.00
N	Y		X	X	X			X	1	1	79	0.00
N	Y		X	X	X	X	X		1	5	235	0.00
Y	N								11	1,234	4,193	0.02
Summary									898	41,010	3,481,782	16.45
Excluded from IEEE Reporting = =>									1	1	79	0.00

DTE and IEEE Reporting - Event Exclusion / Inclusion Comparison
Year 2003

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Included In Reporting		DTE Reporting Exclusion Criteria							Average Customers Served = => 212,823			
DTE	IEEE	Duration < 1 Minute	Customer Equipment / Generation	External/Planned Outage	Secondary Voltage	Transformer Fuse or Breaker	Secondary	Secondary or Service	Trouble Spot Count	Customers Affected	Customer Minutes	SAIDI
N	Y							X	2	2	759	0.00
N	Y						X		19	95	93,277	0.44
N	Y						X	X	4	4	638	0.00
N	Y					X			12	49	10,957	0.05
N	Y					X		X	3	9	3,139	0.01
N	Y					X	X		1	1	1,196	0.01
N	Y				X				67	243	58,368	0.27
N	Y				X			X	37	115	16,895	0.08
N	Y				X		X		52	91	35,880	0.17
N	Y				X		X	X	171	214	90,719	0.43
N	Y				X	X			98	372	70,297	0.33
N	Y				X	X		X	60	259	58,132	0.27
N	Y				X	X	X		9	46	5,795	0.03
N	Y				X	X	X	X	25	74	20,440	0.10
N	Y			X					230	97,108	11,497,311	54.02
N	Y			X		X			1	1	31	0.00
N	Y			X	X				5	81	8,170	0.04
N	Y			X	X			X	3	12	183	0.00
N	Y			X	X		X		1	1	724	0.00
N	Y			X	X		X	X	2	12	3,351	0.02
N	Y			X	X	X			14	53	7,195	0.03
N	Y			X	X	X		X	3	15	295	0.00
N	Y			X	X	X	X		1	5	35	0.00
N	Y			X	X	X	X	X	3	11	523	0.00
N	Y		X		X				5	5	340	0.00
N	Y		X		X			X	2	2	99	0.00
N	Y		X		X	X		X	1	1	22	0.00
N	Y		X	X	X	X	X	X	1	1	136	0.00
Y	N								6	1,107	4,782	0.02
Summary Excluded from DTE Reporting = =>									832	98,882	11,984,907	56.31
Excluded from IEEE Reporting = =>									6	1,107	4,782	0.02

DTE and IEEE Reporting - Event Exclusion / Inclusion Comparison
Year 2004

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Included In Reporting		DTE Reporting Exclusion Criteria							Average Customers Served ==>			
DTE	IEEE	Duration < 1 Minute	Customer Equipment / Generation	External/ Planned Outage	Secondary Voltage	Transformer Fuse or Breaker	Secondary	Secondary or Service	Trouble Spot Count	Customers Affected	Customer Minutes	SAIDI
N	Y		X		X	X	X	X	1	12	708	0.00
N	Y		X		X		X		1	1	11	0.00
N	Y		X		X				13	19	1,339	0.01
N	Y			X	X	X	X		2	21	491	0.00
N	Y			X	X	X		X	4	92	3,617	0.02
N	Y			X	X	X			5	13	593	0.00
N	Y			X	X		X	X	3	5	665	0.00
N	Y			X	X		X		1	1	19	0.00
N	Y			X	X			X	3	7	406	0.00
N	Y			X	X				3	46	1,548	0.01
N	Y			X		X			1	2	1,040	0.00
N	Y			X					139	25,874	1,399,523	6.56
N	Y				X	X	X	X	27	176	24,771	0.12
N	Y				X	X	X		12	169	22,415	0.11
N	Y				X	X		X	56	295	52,872	0.25
N	Y				X	X			84	467	120,536	0.56
N	Y				X		X	X	130	381	101,622	0.48
N	Y				X		X		32	100	23,189	0.11
N	Y				X			X	51	128	12,609	0.06
N	Y				X				73	238	63,971	0.30
N	Y					X	X	X	1	12	852	0.00
N	Y					X		X	7	42	5,270	0.02
N	Y					X			53	807	202,735	0.95
N	Y						X	X	3	3	554	0.00
N	Y						X		5	80	11,745	0.06
N	Y							X	4	19	4,995	0.02
Y	N								4	6,649	19,768	0.09
Summary									718	35,659	2,077,864	9.74
Excluded from IEEE Reporting ==>									4	6,649	19,768	0.09

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Currently the exclusion is 15 percent of customers are excludable. Under the Tmed, excludables are also reflected, which should reflect into some kind of customer impact. Provide the comparison of whether your analysis is based on customer-outage hours or minutes.

Response:

Attached below as Appendix A is an analysis, for the years 2000 through 2004, comparing the 15 percent customer exclusion versus the IEEE 1366 Standard for the major events that occurred in each of those years. The trouble spot counts, customers affected, customer minutes, and SAIDI are shown for each major event along with the cause of the event.. During this time period only one event was excluded based on the DTE defined 15 percent customer threshold. The event was an ice storm that occurred on December 15, 2003.

The table below provides explanation of the columns on Appendix A:

Column	Comments
Calendar Year	
Average Customers Served	The 12 month average of the monthly customer counts
15% Customer Threshold	The threshold is calculated using the Average Customers Served from the previous year. Thus, the current year reporting.
Tmed	A SAIDI exclusion threshold value calculated in accordance with the IEEE 1366 reporting criteria. reliability data.
Excluded DTE	N = No Y = Yes # = Excluded based on the cause being external to the WMECO system, not because of the customer
Excluded IEEE	N = No Y = Yes * = Excluded based on a management decision that the thunderstorms were a continuous two day
Date	The day of the event
Trouble Spot Count	Number of repair locations
Customers Affected	
Customer Minutes	
SAIDI	Calculated as Customer Minutes/Average Customers Served
Storm/Event Defined	

Calendar Year	Average Customers Served	15% Customer Threshold	Tmed	Excluded		Date	Trouble Spot Count	Customers Affected	Customer Minutes	SAIDI	Storm/Event Defined
				DTE	IEEE						
2000	209,288	31,245	10.8873	N	Y	03/11/2000	54	5,324	3,732,476	17.83	Ice Storm
				N	Y	06/02/2000	133	19,651	6,031,329	28.82	Thunderstorms
2001	210,539	31,393	10.2979	N	Y	06/30/2001	92	12,689	5,131,482	24.37	Thunderstorms
2002	211,625	31,581	8.9071	N	Y	08/02/2002	94	13,222	2,595,748	12.27	Thunderstorms
				N	Y	09/11/2002	151	12,509	2,950,201	13.94	Wind Storm
				N	Y	11/17/2002	75	7,623	2,502,645	11.83	Ice/Wind Storm
				N	Y	11/18/2002	129	8,262	4,199,010	19.84	Ice/Wind Storm
				N	Y	12/12/2002	128	21,963	2,675,974	12.64	Snow Storm
2003	212,823	31,744	9.1827	N	Y	07/21/2003	36	8,072	3,175,244	14.92	Thunderstorms
				#	Y	08/14/2003	71	49,753	4,754,543	22.34	Blackout
				N	Y	10/15/2003	140	13,548	3,406,396	16.01	Heavy Winds
				N	Y	11/13/2003	110	11,632	5,752,899	27.03	Heavy Winds
				N	Y	11/14/2003	185	9,922	3,830,086	18.00	Heavy Winds
				Y	Y	12/15/2003	61	38,244	7,961,376	37.41	Ice Storm
2004	213,417	31,923	9.9334	N	Y	08/20/2004	46	7,189	2,401,479	11.25	Thunderstorms
				N	*	08/21/2004	65	4,675	1,551,040	7.27	Thunderstorms
				N	Y	12/01/2004	102	11,339	2,628,881	12.32	Rain/Wind

Western Massachusetts Electric Company
Docket No. DTE 04-116

Record Request HD-01
Dated: 09/09/2005
Q- RR-006
Page 1 of 10

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Provide your company's repair, inspection and maintenance guidelines and/or procedures for underground and overhead.

Response:

Attached below is a copy of WMECO's Repair, Inspection & Maintenance Practices. Also attached are the two forms referred to in the document.

WMECO's REPAIR, INSPECTION & MAINTENANCE PRACTICES

Overhead and Underground Systems

WMECO has the following systems and processes in place that apply to both the overhead and underground distribution systems which dictate where our repair, inspection, and maintenance efforts should be directed.

System Performance Monitoring

WMECO System Planning continually monitors the performance of the overhead and underground distribution system and makes recommendations as needed to address deficiencies. All overhead and underground circuits are assigned and the responsible parties review all events that occur on their circuits on a daily basis. This process helps to identify any additional work needed beyond the immediate repair to prevent repeat occurrences. These individuals also look for trends that indicate circuit performance is deteriorating. If the source of the problems can be isolated to specific portions of a circuit, those sections are scheduled for repair or replacement.

System Operational Review Committee

WMECO has a monthly meeting of our System Operational Review Committee ("SORC"). This committee is made up of all of the individuals with lead roles in WMECO's Operations and Engineering Groups. This committee discusses all the details surrounding any major outages that occurred in the previous month. The purpose of the discussion is to ensure that action has been taken to prevent a recurrence of the events.

In addition to the WMECO issues, SORC reports from the other Northeast Utilities (NU) operating companies, Connecticut Light and Power ("CL&P") and Public Service Company of New Hampshire ("PSNH"), are reviewed to determine if there are any items that can be applied to WMECO.

Equipment Failure Reporting System

An Equipment Failure Reporting System ("EFRS") is used by NU to collect and analyze all reports of equipment failures, especially those which result in outages. The data is collected from all of the NU operating companies, WMECO, CL&P, and PSNH. WMECO receives the benefit of equipment failures being tracked over the entire NU System, where troublesome equipment will show up more readily due to the larger equipment population.

The equipment failure reporting system is connected to the Electronic Dispatch System and any interruption which is identified as caused by equipment failure is automatically entered into the EFRS for follow-up analysis. Equipment failure reports are also entered for equipment which fails even if an outage does not occur, or if incoming inspections identify defective equipment. The main goal of the EFRS is to identify equipment and material where the failure rates are increasing so appropriate action can be taken to address the problem.

Using the data in the EFRS, annual reports of the worst performing equipment are generated to develop remedial action to mitigate the frequency and duration of future failures. The report lists the items found to be the five worst performers for overhead, direct buried, and underground equipment. It describes the problems with each, current solutions, and future actions to be taken.

Overhead Distribution System

WMECO's distribution system is predominately overhead. As the overhead system is vulnerable to damage from the weather and its condition can be readily inspected, there are numerous inspection and maintenance practices in place to continuously assess its condition.

Pole Inspections

WMECO performs annual pole inspections. The areas are chosen based on age and patrol information from our System Planning Group. The areas where the poles are inspected are the ones believed to be in the worst condition. WMECO prioritizes and completes repairs as needed based on the results of the inspections.

Major Equipment Inspections

WMECO performs periodic inspections of all major equipment on the overhead system. The items inspected include: reclosers, sectionalizers, voltage regulators, capacitors, and group operated air break switches. Repair or replacement is scheduled for any items found to be deficient.

Direct Buried Equipment Inspections

WMECO considers its direct buried distribution system to be part of the overhead system as these areas are typically supplied from an overhead pole line. WMECO performs periodic inspections of the padmount transformers and their associated secondary handholes in these areas.

Circuit Patrols

All of WMECO's overhead distribution circuits are patrolled quarterly by our System Planning Group. One of these patrols is a full circuit patrol and the other three are backbone patrols. In addition to these scheduled patrols, after storms WMECO attempts to patrol any circuit that has seen major storm interruptions.

These patrols help to avoid outages on our overhead lines by identifying problems before a fault occurs. Typical items found are tree problems, limbs on the line, open capacitor bank fuses, blown lightning arresters, broken guy wires, etc. Once a problem is found, the need to make corrections is prioritized and repairs are scheduled with the overhead line department that covers the area in which the problem was found.

WMECO's Overhead Line Department also patrols right-of-way portions of 17 distribution circuits where the terrain is extremely rough with all terrain vehicles on an annual basis. Any problems found are prioritized and fixed accordingly.

Infrared Patrols

WMECO performs infrared patrols on all circuit backbones (from the substation out to the first set of fuses) on an annual basis. This type of patrol is used to find equipment that is in the process of failing. The most common finds are loose connections. The items that are found to need repair are fixed based on the amount of temperature rise over ambient based on the following guidelines:

<u>Class</u>	<u>Temp. Rise</u>	<u>Response</u>	<u>Comments</u>
1) Minor	1 - 10 deg C	Routine	Repair next regular maintenance
2) Alert	10 - 25 deg C	2 - 4 weeks	Repair in near future, monitor load
3) Serious	25 - 45 deg C	1 - 2 weeks	Repair immediate future, inspect for damage
4) Critical	45 - 75 deg C	1 - 6 days	Repair immediately, replace components
5) Emergency	> 75 deg C	Immediate	Repair immediately

In addition to the annual patrols, special infrared patrols and inspections are done at the request of the System Planning Group for issues such as circuit loading changes and on circuits where downstream faults may have stressed upstream equipment.

Vegetation Management Program

WMECO circuit backbones are trimmed on a five-to-six-year cycle. Lateral trimming is scheduled based on reliability, not on a fixed cycle. A Decision Analysis ("DA") Model supplies information on customer-minutes lost due to trees. This information is used in the development of the tree-trimming schedule. In addition to the results from the DA Model, practical knowledge from the WMECO Arborists and our System Planning Group is used to determine where trimming should be done. Along with the scheduled trimming, WMECO handles tree problems that arise on a daily basis.

Underground Distribution System

WMECO's underground distribution system cannot be readily inspected as the overhead system can. WMECO's 15kV and 25kV underground primary distribution cables are wrapped in arc proof tape and cannot be handled while energized. This condition severely limits the value of visual inspections such that WMECO does not do periodic inspections of all underground manholes. Much of the company's approach to assessing the risk of future failures relates to previous experiences with various types and ages of cables and splices and information derived from the systems and processes identified at the beginning of this document. WMECO has the following programs in place specific to the underground.

Network Transformer Vaults

WMECO has a maintenance and inspection program for the network transformer vaults within its underground network systems. WMECO does inspections on the network systems due to relatively large number of customers served and the possibility of large scale outages due to failures within these systems. Network transformer vaults are inspected annually and the network protectors, attached to the transformers, are maintained every two years. Written records of these inspections are recorded on the Network Transformer Maintenance Report, Form OP4013-1 REV 2-05, a copy of which is attached. Hard copies of these reports are maintained in our District offices. The information is also entered into an electronic database.

Manholes and Service Boxes

All other manholes and transformer vaults within WMECO's underground distribution system are inspected upon entry for any reason. If the entry is in response to a failure, the manhole is carefully checked to ensure the integrity of all other cables and equipment located in the manhole.

Service boxes are inspected upon opening.

WMECO uses a Matrix (copy attached) for guidance in assessing the time frame for repairing items found. Any item found to be in eminent danger of failing and creating a safety concern, (either to the general public or WMECO personnel), a circuit outage, or both is addressed immediately. Typical examples are wires found to be arcing or where the insulation has been compromised and energized parts are exposed. WMECO relies on the expertise of its Underground Line Dept. Supervisors to determine if an item requires immediate attention.

Once a problem is identified, the need to make corrections is prioritized and repairs are scheduled with the underground line department that covers the area in which the problem was found.

Network System Modeling

WMECO System Planning maintains electronic models of all of its 208Y/120 volt secondary network systems and performs load flow analysis on an as needed basis due to changing load conditions.

Partial Discharge Cable Testing

WMECO has employed KEMA Powertest to perform partial discharge (PD) cable testing on circuits that have been identified by System Planning as having failure rates at higher than acceptable levels. The theory behind the PD testing is that it can locate "weak" areas within an underground cable system and allow for repairs to be made before a failure occurs. WMECO has had limited success with PD cable testing as have most other utilities that have tried it. WMECO does not plan to do any future testing of this type due to the high cost and somewhat intangible benefits that are obtained.

4160 Volt Conversion Project

WMECO identified the need to replace its 4160 volt distribution system many years ago and is in the midst of a multi-year (25+/-) plan to eliminate all of its underground 4160 volt distribution circuits. The 4160 volt distribution system is 55 – 65 years old and at the end of its useful life. WMECO is replacing the radial 4160 volt distribution systems with new 13,800 volt, or 23,000 volt, looped systems that can handle the loads better and offer a much improved level of reliability. The proactive replacement of these systems has greatly reduced the number of repairs needed on this population of circuits over the years. WMECO System Planning determines the schedule of the conversions (4160 volt to 13,800 volt and 23,000 volt) based on the reliability performance and load forecast results of the remaining 4160 volt circuits.

UG Network Maintenance Prioritization Matrix					
Max. Resolution Time, Months					
NUMP Section	Problem/Task	Immediate	1 to 3	4 to 12	13 to 24
U2-3	Cable - failure of continuity check	X			
U2-3, U3-2, U4-2, U6-2	Leaking splices	X			
U2-3, U3-2, U4-2, U6-2	Collapsed splices/sleeves	X			
U1-4, U3-2, U4-2, U6-2	Electrical tracking on primary cable or terminations/Other problems with terminations	X			
U3-3, U4-2	Failure of leakage check - cableheads or stuffing boxes	X			
U1-4	Inadequate support of cables		X		
U2-3, U3-2, U4-2, U6-2	Bulged splices		X		
U2-3, U3-2, U4-2, U6-2	Cable arc-proofing		X		
U2-3	Cracks in lead sheath of cable/splice		X		
U1-4, U3-4, U4-2, U6-2	Cable movement on racks			X	
U1-4, U3-2, U4-2, U6-2	Cable "slipping downhill"			X	
U1-4	Cables need to be neatened and tied down/placed in supports			X	
(U1-4)	Mapping/drawings need to be brought into agreement with actual configuration of cables/conduits, etc.				X
U1-4, U2-3, U3-2, U6-2	Re-tag cables as necessary				X
U1-4, U3-2, U4-2, U6-2	Duct shields (nylon-like covers) must be placed where cables emerge from ducts				X
(U1-4)	Configuration improvement, e.g., convert 4 or 5 splices in hole to 1 or 2, etc.				X
U1-3, U6-2	Improper oil levels - switch or transformer	X			
U1-3	High transformer oil temperature	X			
U1-3	Record secondary load data - present and maximum	X			

NUMP Section	Problem/Task	Max. Resolution Time, Months			
		Immediate	1 to 3	4 to 12	13 to 24
U1-4, U1-6, U3-2, U6-2	Repair loose electrical connections	X			
U1-4, U6-2,	Maintain proper oil levels in transformer, switches	X			
U1-5	Cooling fan maintenance - (if applicable) - check, clean and oil	X			
U1-4, U3-2, U6-2,	Transformer leaks	X			
U1-4, U1-7	Pressure test failure - transformer, protector, switch	X			
U1-6	Cracks/oil leaks in secondary bushings	X			
U3-2	Problem with links/fuses	X			
U3-3	Fuse box - failure of pressure test	X			
U3-2	Wall-mounted cutouts - oil leaks	X			
U3-2	Wall-mounted cutouts - contact pitting/electrical erosion	X			
U3-2	Wall-mounted cutouts - inadequate attachment/security		X		
U6-3	Wall-mounted cutouts - severe rusting/deterioration		X		
U3-3	Attachment & security of wall-mounted fuse boxes		X		
U1-6	Evidence of overheating on current-carrying parts		X		
U1-4, U2-3	Limiter - Amprobe check shows blown limiter			X	
(U1-4)	Re-tape eroded from bus bars			X	
(U1-4)	Install rubber "hammerheads" to clean up configuration				X
U1-4, U3-2, U6-2,	Severe Rusting - Transformer/Protector				X
U1-6	Protector - closing motor - requires oil/grease	X			
U1-6	Protector - closing motor - commutator requires cleaning	X			
U1-7	Protector - Failed minimum trip voltage - shunt trip test	X			
U1-7	Protector - Failed motor control relay - pickup test	X			
U1-7	Protector - Failed master relay - overvoltage closing test	X			
U1-7	Protector - Failed master relay - reverse-current trip test	X			
U1-7	Protector - Failed phasing relay - overvoltage closing test	X			
U1-7	Protector closing motor test failure - minimum operating voltage	X			
U1-6	Protector - Manual breaker operation shows improper operation of linkage, latching, or clearances, etc.	X			
U1-6	Switch position mechanical indicator	X			
U6-3	Switch - oil leak	X			
U4-2	Switch contacts - pitting and electrical erosion	X			
U4-6	Switch - failed pressure test	X			
U4-6	Switch - Improper oil level	X			
U1-4, U2-3, U4-2, U6-2	Sump pump problems/blockage	X			
U1-4, U6-2,	Blockage of drains	X			
U6-2	Sump or door sill not in proper condition to contain oil spills	X			
U6-2	Vault and entrance not clear of foreign materials	X			

NUMP Section	Problem/Task	Max. Resolution Time, Months			
		Immediate	1 to 3	4 to 12	13 to 24
U6-2	Accessibility to vault not properly secured to prevent unauthorized entry	X			
U1-4, U3-2, U4-2, U6-2,	Physical appearance of manholes - correct as necessary			X	
U6-2	Objects blocking ventilation of switchgear	X			
U1-4,	Roof/grate problems - Gratings clogged, bent, warped, broken		X		
U1-4, U3-3	Grates, manhole covers, and frames - Minor clean-up and straightening as necessary		X		
U1-4, U3-2	Concrete broken - pieces missing - walls, floor, roof, etc.				X
U1-4, U3-3	Grates, manhole covers, and frames - Major maintenance necessary			X	
U7-2	Corrosion protection - Rectifier problem				X
U7-2	Corrosion protection - Anode problem				X
Note: NUMP Section Nos. in parentheses indicate proposed placement of items not currently in NUMP.					

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Please detail the training requirements for employees likely to be performing work with electric distribution company systems -- for both internal and external employees and contractors.

Response:

Please see attached letters filed with the Department in its request for comments on Maintenance and Inspection Practices, WMECO and the other NU companies utilize a Time Merit Progression Program, ("TMP"), which was developed by both Management and Union representatives working in close cooperation. The TMP Program provides an opportunity for employees to learn the skills and gain the knowledge necessary to become a qualified journeyman through a 48-month apprentice training program. The program is made up of on-the-job training supported by formalized training programs. This type of training is designed to enable the company to utilize workers for day-to-day work, up to their level of qualification, while they progress through the training steps. The Company has TMP Programs specific to each electrical worker job classification. The TMP programs for overhead and underground workers are very similar, with differences determined by the skill levels required by the various classifications. An example of the training required for underground electrical workers is provided below.

To successfully complete the program, individuals are required to complete all the formal training schools listed below with a minimum score of 70% on written examinations and 80% on practical tests.

- Basic Splicer Helper School (Five Weeks)
- Introduction to Tools and Equipment
- Introduction to NU UG Distribution Standards
- Confined Space and Manhole Rescue
- Hoisting and Rigging for cable installation
- 32 Hour Asbestos Worker Certification Course
- Basic Electricity
- CDL Training (two weeks)
- Class A License
- Direct-Buried School (two weeks)
- Splicing/Terminating cable
- Print Reading
- Cable Theory
- Fault locating
- Trenching and shoring

In addition to the TMP Program, all employees are required to participate in a three-to-five day Skills Enhancement Refresher Training Program each year. The purpose of this program is to refresh employees on required skills and to update them on applicable work practice changes.

WMECO, in general, does not provide training to contractor employees. Training has been provided, on occasion, for specific unique processes or procedures. It is the contractor's responsibility to provide job training to its employees and demonstrate to the Company that it has properly trained workers, before they are allowed to work for the Company. Contractor bid packages are provided to Contractors being considered for employment by Northeast Utilities. The bid package includes a copy of Northeast Utilities Contractor Work Rules and site- or project-specific environmental, health and safety requirements. A copy of the Northeast Utilities Contractor Work Rules is attached below. Training requirements for Contractor personnel who will work under NU procedures (e.g., station confined space procedures, hazardous waste sites) will be explained in the site-specific instructions. Northeast Utilities explicitly requires the Contractor to do the following:

- To provide and properly maintain all appropriate safety equipment;
- To provide training on the use of the equipment;
- To use adequately trained workers under competent supervision;
- To have documentation of training readily available for NU inspection;
- To have documentation of all necessary testing and maintenance records for equipment used on the project readily available for NU inspection.

September 1, 2004

Mr. Ronald F. LeComte
Director - Electric Power Division
Department of Telecommunications & Energy
One South Station, 2nd Floor
Boston, MA 02110

Dear Mr. LeComte:

This letter responds to the Department of Telecommunications and Energy's (the "Department") August 10, 2004 letter directing Western Massachusetts Electric Company ("WMECO") to provide information to the Department regarding its Maintenance and Inspection Procedures of Underground Facilities. In response to that request, the following information and answers to the specific questions relating to maintenance and inspections procedures are provided.

Background

The majority of WMECO's distribution facilities are built utilizing overhead construction. There are underground, duct and manhole, distribution facilities located in seven of the fifty-nine cities and towns that WMECO serves. Four of the towns have conventional underground network systems installed. In total, there are approximately 3,750 manholes in WMECO's service territory, ninety percent of which are located in Springfield.

Following is the information requested by the Department:

1. Describe the Company's maintenance and inspection procedures for underground facilities, including manholes, vaults, and service boxes. Include information on the frequency of maintenance and inspection and attach any checklist. Also, provide information on the status of the Company's maintenance and inspection program.

WMECO has a maintenance and inspection program for the network transformer vaults within its underground network systems. WMECO does inspections on the network system due to relatively large number of customers served and the possibility of large scale outages due to failures

within these systems. Network vaults are inspected annually and the network protectors, attached to the transformers, are maintained every two years. Written records of these inspections are recorded on the Network Transformer Maintenance Report, a copy of which is attached to this letter. All other manholes within WMECO's underground distribution system are inspected upon entry for any reason.

2. Describe the Company's record keeping of underground system events, including for manholes, vaults, and service boxes. Please indicate whether the Company tracks and classifies events for manholes, vaults, and service boxes, such as by (i) smoke, (ii) fire, and (iii) manhole cover dislodging and explosions.

Each outage or interruption on WMECO's distribution system is logged into the outage reporting system, a computerized system used for tracking interruptions. The cause for the interruption is listed in the Interruption Summary and must be entered in order to close out the interruption. General categories are listed, such as equipment failure, tree, lightning, etc. WMECO's reporting system at this time does not allow for the options of categorizing, or sorting the interruptions by cause such as smoke, fire, or explosion. The system operator may enter such information in the description of the incident; however, the system does not have the ability to sort interruptions or outages by anything that is entered in the narrative of the incident.

Whenever a crew responds to an interruption, a trouble ticket is hand written by the crew or supervisor, detailing the specifics of the incident, including the circuit, location, description of the incident, crew members, as well as the work performed and work remaining, if any. These trouble tickets are maintained in the file for future reference.

3. Describe any manhole event mitigation strategies and efforts undertaken by the Company to study manhole incidents.

In response to the recent incidents in Massachusetts, relating to manhole explosions, WMECO convened a committee of experienced employees to determine the actions that should be taken by WMECO to track, investigate, and document such occurrences on its distribution system. The committee will provide its recommendations and initiatives to management in the coming weeks.

4. Indicate whether the Company's maintenance practices include a process to evaluate underground cables and assess their risk for failures, such as due to age, insulation breakdown, joint failures, etc.

If yes, describe how the Company addresses such risks and whether it prioritizes these events in degree of severity.

Much of the Company's approach to assessing the risk of future failures relates to previous experiences with various types and ages of cables and splices. Individuals from the System Planning group are assigned the responsibility of monitoring all of the distribution circuits, including underground. These individuals review events that occur on their assigned circuits on a daily basis and watch for trends that indicate circuit performance is deteriorating. If the source of the problems can be isolated to specific portions of a circuit, those sections are scheduled for repair or replacement. On occasion, outside cable testing companies have been utilized to test for locations where insulation failure is occurring within a cable system. The test data is used to determine if any portions or components should be replaced.

The Company has an equipment failure reporting system where all equipment failures are recorded. The information in this database is monitored by the Northeast Utilities Distribution Standards group. This group looks for trends for the entire Northeast Utilities System for equipment that is failing at higher than normal rates. WMECO receives the benefit of equipment failures being tracked over the Northeast Utilities System, where troublesome equipment will show up more readily due to the larger equipment population.

WMECO's System Planning group addresses reliability risks by pro-actively planning for replacement of failure prone equipment. An integral part of the planning process is to prioritize the importance of each project that is planned.

5. Identify whether the Company tracks cable and joint failures in a manhole in order to evaluate the risk of future failure.

WMECO tracks all cable and joint failures that occur in its underground distribution system. The locations and dates of the failures are identified on circuit prints maintained by the System Planning employees located in the various area work centers. Failures are investigated and reviewed on a periodic basis to determine trends related to specific cable or splice types, vintages, manufacturers, etc., in order to form a basis for predicting possible future failures, and determining what additional measures should be taken to ensure circuit reliability. The locations where these failures occur are carefully checked to ensure the integrity of other cables and equipment located in the manhole.

6. Describe the Company's practices for determining the root cause of cable and joint failures. Please indicate whether the root cause analysis includes an evaluation of distribution system relay coordination and short circuit levels.

When WMECO investigates a cable or joint failure, attempts are made to determine the root cause of such failures. System Planning will describe the incident, the sequence of events leading up to and following the incident, and any other relevant details that would account for, or contribute to the failure. An evaluation is performed to determine if the protective equipment and relays operated properly, with correct timing and sequencing. Short circuit calculations are typically not performed. The information from these investigations is shared with a group of company operating employees on at least a monthly basis, but more frequently if conditions warrant sooner dissemination of the information.

I can assure you that WMECO holds the safety of its employees and the public in highest regard, and to that end, is dedicated to operating its underground distribution system in a safe and reliable manner. Where opportunities exist to improve reliability, they are identified, prioritized and integrated into WMECO's construction and project planning process. If there are any questions concerning our response to this request for information, please feel free to call me at 413-787-9303 or John Tulloch at 413-787-9018.

Sincerely,

Michael T. Smith
Director - Operations

Attachment

January 19, 2005

Mr. Ronald F. LeComte
Director - Electric Power Division
Department of Telecommunications & Energy
One South Station, 2nd Floor
Boston, MA 02110

Dear Mr. LeComte:

This letter responds to the Department of Telecommunications and Energy's (the "Department") December 14, 2004 letter directing Western Massachusetts Electric Company ("WMECO" or the "Company") to provide additional information to the Department regarding its Maintenance and Inspection Procedures of Underground Facilities. In response to that request, the following information and answers to the specific questions relating to maintenance and inspections procedures is provided.

Background

The majority of WMECO's distribution facilities are built utilizing overhead construction. There are underground, duct and manhole, distribution facilities located in seven of the fifty-nine cities and towns that WMECO serves. Four of the towns have conventional underground network systems installed. In total, there are approximately 3,750 manholes in WMECO's service territory, ninety percent of which are located in Springfield.

Following is the information requested by the Department:

1. Specify the process used to procure electrical contractors for work on underground facilities. Provide an actual request for proposals and a resulting services contract used in the process.

WMECO does not use electrical contractors to perform work on the electrical components of its underground system. Contractors are utilized for underground structural and conduit work only. All electrical work is performed by WMECO personnel. In rare instances where additional help is needed, employees are brought in from other Northeast Utilities' ("NU") companies. These employees are subject to the same qualification and training requirements as WMECO personnel.

2. Identify the qualifications that are required for outside electrical contractors that perform work on underground facilities (e.g., license, training, courses required for each task performed, years of experience).

Not applicable (see the response to Question #1).

3. Explain the process for supervising, reviewing, and approving the work of outside electrical contractors.

Not applicable (see the response to Question #1).

4. Identify the qualifications that are required for in-house Company electrical workers that perform work on underground facilities (e.g., license, training, courses required for each task performed, years of experience).

Employees applying for entry level underground electrical positions must meet the following general qualifications:

- a) Must pass the Construction and Skilled Trades (CAST) Test. [This is an industry-sanctioned, Edison Electric Institute test for assessing basic job-related aptitudes.]
- b) High school diploma or equivalent.
- c) Possess a valid driver's license from the state in which employee resides and must successfully meet the qualifications for (including medical) and obtain the appropriate license(s), certification(s), and endorsement(s) as required by the Company and the Federal Motor Carrier Safety Regulations.
- d) Successfully complete the requirements of the Splicer Time Merit Progression ("TMP") Program and qualify as a Splicer at the end of training period.
- e) Work emergency and planned overtime when the need exists.
- f) Acquire a basic knowledge of the Company's safety manual and perform work in conformance with safe work practice and Company standards including the use of safety equipment such as oxygen testing, gas testing, rubber gloves, rubber blankets and thermal blankets.
- g) Perform duties as required indoors and outdoors, at times under adverse weather conditions, for extended period of time as required.
- h) Mechanical ability to assist operations with material, hand tools and equipment pertinent to the installation and maintenance of cables and the underground system.
- i) Clean, paint, lubricate, and make minor repairs to underground system equipment, devices, and structures.
- j) Climbs and performs work off the ground. Perform duties in confined places and in close proximity to energized cable and conductors.

- k) Meet physical requirements as required by medical placement examination(s).
- l) Must live within 30 minutes of the reporting location. This position will be considered a shift position and employee may be required to work a four, ten-hour day schedule.* (*Employees hired after 10/01/01)

Fully qualified cable splicers must maintain skill and proficiency in cable installation and repair. An explanation of the refresher training is provided in the answer to Question #6. It generally takes between four and five years for an employee to progress through the TMP Program and become fully qualified as a cable splicer.

5. Explain whether your Company maintains a splicing and repair log containing such information as dates of installation, crew members performing the work, and materials used. If this type of information is maintained, is it stored in an information database?

WMECO does not maintain such a log for recording repairs to cable as a result of failure. However, it does have two systems where information relating to outages is maintained. The Outage Management System maintains a record of all outages that occur on the distribution system and the causes for each one. In addition, the Company maintains an Equipment Failure Reporting System for reporting and documenting failures of materials and equipment. Based on the nature and frequency of such failures appropriate steps are taken to prevent recurrences; e.g. follow-up with manufacturer if defective, change equipment specifications, develop proactive replacement programs, etc. Locations and dates of cable failures are identified on circuit prints maintained by the System Planning employees located in the various area work centers. Additionally, whenever a crew responds to an interruption, a trouble ticket is hand written by the crew or supervisor, detailing the specifics of the incident, including the circuit, location, description of the incident, crew members, as well as the work performed and work remaining, if any. These trouble tickets are maintained in the file for a period of three years.

6. Explain the training program in place for personnel that work on underground facilities.

WMECO and the other NU companies utilize a TMP Program which was developed by both Management and Union representatives working in close cooperation. The TMP Program provides an opportunity for employees to learn the skills and gain the knowledge necessary to become a qualified journeyman through a 48-month apprentice training program. The program is made up of on-the-job training supported by formalized training programs. This type of training is designed to enable the company to utilize workers for

day-to-day work, up to their level of qualification, while they progress through the training steps.

To successfully complete the program, individuals are required to complete all the formal training schools listed below with a minimum score of 70% on written examinations and 80% on practical tests.

- Basic Splicer Helper School (Five Weeks)
- Introduction to Tools and Equipment
- Introduction to NU UG Distribution Standards
- Confined Space and Manhole Rescue
- Hoisting and Rigging for cable installation
- 32 Hour Asbestos Worker Certification Course
- Basic Electricity
- CDL Training (two weeks)
- Class A License
- Direct-Buried School (two weeks)
- Splicing/Terminating cable
- Print Reading
- Cable Theory
- Fault locating
- Trenching and shoring

In addition to the TMP Program, all employees are required to participate in a three-to-five day Skills Enhancement Refresher Training Program each year. The purpose of this program is to refresh employees on required skills and to update them on applicable work practice changes.

Training of craft workers at WMECO is taken very seriously. As indicated above, the training our employees receive is quite extensive. Our goal is to ensure that employees work safely and that the work methods and practices support our efforts to operate our underground distribution system in a safe and reliable manner. If there are any questions concerning our response to this request for information, please feel free to call me at 413-787-9303 or John Tulloch at 413-787-9018.

Sincerely,

Michael T. Smith
Director - Operations

cc: John Cope-Flannagan

NORTHEAST UTILITIES CONTRACTOR WORK RULES**I. Introduction**

1. These Work Rules govern the safety and environmental aspects of the way that Contractors and their subcontractors and agents perform work at NU facilities, properties or work sites. These work Rules convey NU's minimum expectations regarding safety and environmental practices and may exceed the requirements of federal, state and local regulatory agencies. These Work Rules are in addition to any safety and environmental procedures, policies, guidance, and/or work instructions of the Contractor. Failure to comply with any portion of these work rules is a breach of contract, and is just cause for expulsion from NU properties and termination of the contract.
2. Contractors are required to inform their employees, subcontractors, and agents of these Work Rules prior to the start of work and to ensure compliance with the Work Rules.
3. All Contractors and their employees are responsible for ensuring safety and environmental compliance. This includes adherence to the following:
 - a. State, federal, and local safety, health, and environmental requirements that are in effect or that may take effect during the work;
 - b. Guidance and work instructions;
 - c. Site-specific rules and/or addenda.
4. Each Contractor is and shall remain an independent Contractor as to all work performed under the contract. Nothing herein shall relieve Contractors of their sole responsibility for the safety of their employees and their environmental performance. As such, NU expects them to take appropriate action to ensure that safety and environmental requirements are adhered to.
5. Neither compliance with these work rules nor NU's approval of any actions or procedures of the Contractor shall relieve the Contractor of its obligation to always use due care in performing work and to take any additional precautions necessary to prevent injury, adverse effects on the environment, or property damage. The Contractor shall ensure safe work practices, protect the environment and monitor the project's environmental and safety effects during the work.
6. In accordance with NU's Environmental Management System (EMS) and the requirements of ISO 14001, Contractors are required to ensure their employees, subcontractors, and agents are aware of:
 - a. The four tenets of the NU Environmental Policy (maintaining Compliance, demonstrating Leadership, ensuring Accountability and practicing Stewardship);
 - b. The scope of their job and how it impacts the environment;
 - c. Who to call in cases of emergencies.

II. General Safety and Environmental Rules

1. Planning and Forethought – The Contractor shall exercise planning and forethought regarding all work. As a minimum, this requires the Contractor to apply the same planning and management skills to the safety and environmental aspects of the job as to the bid preparation, work assignment, job scheduling, and other productivity and quality aspects. In some cases, this may suggest that a Contractor develop a site safety and environmental management plan for the work and/or assign a person with full-time or collateral safety and environmental oversight responsibilities. The minimum elements of such a plan are identification of the major hazards that could be expected, actions to be taken to eliminate or control exposures to these hazards, communication and coordination with other potentially affected parties and oversight to ensure the plan is implemented effectively.
2. Emergency Response – Prior to the start of work, Contractors must coordinate emergency response with NU. This may include preferred means of reporting and responding to medical, environmental and security emergencies, evacuation alarms and routes, available medical treatment facilities, etc.
3. Medical Treatment – Contractors shall be equipped with their own first aid kits. Contractors are responsible for arranging for transportation for their employees to receive medical attention for minor injuries.
4. Pre-job Safety and Environmental Briefings – Contractors must conduct pre-job safety and environmental discussions (commonly known as toolbox discussions, tailboard discussions, etc.) with all workers that will be involved in the job at the start of each shift, when the scope of work changes, and before new work assignments. These discussions must cover the actual and potential hazards of the job, environmental considerations, the specific PPE requirements, NU EMS requirements, and all other precautions required to prevent injury or damage and to protect the environment.
5. Training Records – Contractors shall have training and certification records, licenses, and other such documentation for their employees that are pertinent to the work to be performed either on site or available within twenty-four hours and subject to review by NU. *Failure to produce training records within such time may be considered breach of the contract and shall entitle NU, at its option, to terminate such contract without further liability on its part.*
6. Inspection and Maintenance Records – Inspection, maintenance, repair, and certification records of cranes, hoists, personnel lifts, scaffolds, excavations, etc., are subject to NU review and must be readily available.
7. Alcohol, Drugs, and Firearms – No alcoholic beverages, beverages labeled as “non-alcoholic,” controlled drugs (other than prescribed drugs),

or firearms are allowed on NU facilities, properties or work sites, including parking lots, nor shall any worker under the influence of alcohol and/or drugs be allowed on NU facilities, properties, or work sites. The sale or use of alcohol and/or drugs on NU facilities, properties, or work sites is strictly prohibited.

8. Regulatory Inspections – Contractors shall promptly inform the NU liaison of any and all inspections, visits, observations, audits, or inquiries of any kind (telephone, electronic, in-person, etc.) (collectively “Inspections”) affecting or pertaining in any way to the Contractors’ work under the contract by any federal, state or local agency, and the reasons therefore Contractors shall keep the NU liaison updated on the status of any regulatory matters arising out of such Inspections, including but not limited to safety, health, and environmental citations and violations.

III. Specific Safety and Health Rules

1. Trenching and Excavating – No trenching or excavation work may begin until the Contractor has designated a competent person to oversee the work and has informed NU of the name(s) of the competent person(s) and the basis for such determination. Contractors are to assume the soil is Type C unless they prove otherwise with “Call Before You Dig” or “Dig Safe” agency the requisite number of days (typically 2-3 business days) prior to the planned start of any excavation. All unattended trenches and excavations shall be guarded to prevent inadvertent falls.
2. Scaffolding – No scaffolding work may begin until the Contractor has designated a competent person to oversee the work and has informed NU of the name(s) of the competent person(s) and the basis for such determination. 100% fall protection or restraint is required at all times during erection, maintenance, use and dismantling of the scaffold whenever the fall hazard is six (6) feet or greater unless the competent person possesses documentation clearly describing why using 100% fall protection or restraint is not feasible or creates greater hazards. The documentation shall also describe the methods that will be implemented to achieve as close to 100% fall protection or restraint as possible. Scaffold components may not be used for fall protection or restraint anchorage unless Contractor similarly possesses documentation by a “qualified person” as defined by OSHA 29CFR 1926.450 validating the suitability of the components for such use. All documentation must be readily available for review by NU. In addition, from the time scaffold erection is begun until scaffold dismantling is completed, the competent person shall inspect all scaffolding and associated components at least once each work shift prior to their use and shall affix signs, tags, or equivalent means to conspicuously mark whether the scaffolding is or is not safe to use. Transfer of responsibility for the maintenance and inspection of the scaffolding must be coordinated and clearly noted among NU and other parties involved.

3. Fall Protection – 100% fall protection is required for workers exposed to fall hazards of four (4) feet or greater from structures that support overhead electrical lines (e.g., poles, towers, structures), six (6) feet or greater, in other construction activities, and lesser heights with the potential for serious injury, unless the competent person possesses documentation clearly describing why using 100% fall protection or restraint is not feasible or creates greater hazards. The documentation shall also describe the methods that will be implemented to achieve as close to 100% fall protection or restraint as possible.
4. Housekeeping – Contractors shall keep the job site neat, clean, and free of debris, trash, and hazards. Contractor shall store all materials in a neat and orderly fashion. At a minimum, the Contractor shall police the work area at the end of each shift.
5. Hot Work – Hot work is any work that involves the use of burning or welding equipment, brazing equipment, explosives, open flames, grinders, powder actuated tools, and any other activity that produces a flame, spark, or excessive heat. Hot work shall be coordinated with the NU liaison in advance. Hot work requires the Contractor to conduct a hazard assessment and take appropriate actions to prevent the ignition of combustible and flammable materials, including but not limited to the use of welding tarps, fire watches, and the ready availability of fire extinguishers.
6. Smoking – Smoking is prohibited in and within 25 feet of all NU facilities, within 25 feet of flammable materials, and in other designated areas.
7. Lifting and Hoisting – The Contractor shall not move loads suspended from mobile equipment without the load being secured to prevent swinging. Tag lines shall be used on all loads except when there is a danger of the equipment, load, or tag line making contact with energized parts. Swing load radius must be kept clear during moving of suspended loads. Lifting devices and hardware (slings, chain, shackles, etc.) shall be rated and properly connected for the application. Load charts shall be available and no load may be lifted until its weight has been determined.
8. Guarding of Holes and Openings – The Contractor shall guard or place appropriate barricades around temporary openings in floors, walls, excavations, etc., to prevent inadvertent entry. Covers over excavations or floor holes shall be of sufficient strength, conspicuously marked to indicate the hazard and the danger of removal, and secured to prevent inadvertent movement or removal whenever feasible.
9. Ladders – Only ladders constructed of fiberglass may be used in and around electrical equipment, including substations. Ladders are to be properly positioned. Straight and extension ladders are to be tied off at the top and bottom or footed by another person. Step ladders may not be used in the closed position. No person may stand or sit on the steps or platforms on which standing or sitting is prohibited.

10. Tools and Equipment – Contractors are responsible for providing proper tools and equipment. Except in rare or emergency situations, NU will not provide or lend tools or equipment, including personal protective equipment (PPE.) Tools and equipment shall be maintained in safe condition and used as designed and without removing, defeating, or otherwise compromising guards or other safety devices.
11. Walks and Roadways – When working on NU facilities, properties, or work sites, Contractors shall not hinder or obstruct the normal flow of vehicular or pedestrian traffic without prior coordination with the NU liaison. In such cases, appropriate actions must be taken to alert traffic of the hazard and/or control the flow of traffic to ensure safety. In such cases, Contractor shall provide approved lights, barriers, signs, warning devices, signal persons, and/or other precautions appropriate to the situation.
12. Lock out/Tag out – Work at NU facilities may require the use of a lock out/tag out system. The Contractor is to coordinate lock out/tag out with the NU liaison. In some cases, Contractor may be required to comply with NU's lock out/tag out requirements.
13. Confined Space Entry (including Enclosed Space Entry) – Contractor is to consider all confined spaces as permit-required confined spaces until informed otherwise by NU or until Contractor conducts a written hazard assessment that documents otherwise. The Contractor is to coordinate all entries into confined spaces (whether permit-required confined spaces, non-permit confined spaces, or enclosed areas) with the NU liaison, the local facilities/building supervisor, and other work groups to ensure each other's activities will not affect the safety or health of any person.
14. Personal Protective Equipment (PPE) – As a minimum, most physical work requires the use of ANSI Z87 safety glasses (i.e., including side shields) and ANSI Z41 rated safety shoes. Contractors shall comply with local NU PPE requirements for the location or the type of work. Determining any additional PPE requirements is the responsibility of the Contractor. The Contractor's PPE hazard assessment certifications are subject to review by NU.
15. Barriers, Warnings, Signs, and Signage Credibility – Work areas, whether indoors or outdoors, restricted to entry by authorized persons shall be clearly marked and delineated. Unless otherwise permitted, such marking shall consist of conspicuous rope or tape barrier with appropriate DANGER, CAUTION, or other appropriate signs that (1) note the nature of the hazard and (2) provide guidance to the reader. The placement of orange cones or signs alone is generally not considered adequate. Detours, whether for vehicular or pedestrian traffic, shall be clearly marked along the entire route. Signs, barriers, and similar markings shall be checked and maintained throughout the period of need and shall be removed promptly when the need has ended. When the signs or barriers are not available or their use is not practicable, such as for a momentary

hazard exposure, the Contractor shall post employees to prevent others from being exposed to the hazard(s).

16. Communications with NU Personnel – Planned work activities which may affect NU personnel or disrupt their work shall be coordinated with the NU liaison and communicated to such personnel far enough in advance to allow for coordination, accommodations, or resolution of conflicts.
17. Asbestos, Lead, and Other Hazardous Substances – Asbestos, lead, and other hazardous substances may exist on or at NU facilities, properties and work sites. NU will inform the Contractor of the known presence, location, and quantity of such substances in or adjacent to areas in which the Contractor is expected to work, and the Contractor shall so inform its employees, bring to NU's attention any suspect or questionable substances that may be encountered during the course of work, and take appropriate precautions.
18. Nail Guns and Powder-Actuated Tools – Nail guns, Hilti Guns, and similar tools shall be used in such a manner to ensure the projected fastener cannot miss or penetrate the intended surface and strike an unintended person or object, including but not limited to the fastener becoming an airborne projectile. Precautions include but are not limited to directing the line of fire away from other persons, including passersby, preventing access to the opposite sides of nailing surfaces (e.g. walls) and preventing access closer than 20 feet to Hilti gun use.
19. Fire Retardant (FR) Clothing – The wearing of fire retardant clothing is required in certain locations (e.g., substations) for performing certain electrical or gas activities. The Contractor is to consult with the NU liaison to determine the specific requirements.
20. Electrical (Substation) Awareness – High voltage electrical lines and equipment exist throughout NU facilities. The Contractor must provide, to all persons working under a contract, or ensure they have received, electrical awareness training appropriate to the work they will be performing. The intent of the training is to ensure persons understand the hazards of electricity and the actions they must take to prevent inadvertent contact.
21. Hazard Communication – All Contractor-supplied hazardous materials and chemicals must be approved by NU prior to entry and use on NU facilities, properties or work sites. All MSDS and associated instruction/warning sheets must be provided to NU far enough in advance of the time of intended use to allow for NU review or the materials or chemicals may not enter NU property. Contractor must also have a copy of its Hazard Communication program available. All containers used to handle chemicals, fluids, or hazardous material must be labeled. Minimum label requirements are product name, manufacturer or distributor, and hazard warning.

22. Reporting Injuries and Other Incidents – Contractors are required to report to NU all injuries, however slight, to their personnel immediately but not later than 24 hours of occurrence, and to promptly investigate all injuries. Investigations, which shall include a list of corrective actions taken or planned, are subject to review by NU.

IV. Specific Environmental Rules

1. Enforcement Actions – A complete list of Notices of Violations (NOVs), orders, complaints, citations or other enforcement action(s) against the Contractors and other subcontractors during the last three years inspections by any federal, state or local agency must be submitted as part of the bid package. NOVs and other enforcement/inspection results received during the term of this contract shall likewise be brought to the attention of NU following their receipt.
2. Unplanned Releases to the Environment – The Contractor is responsible for immediately reporting any and all unplanned releases to the NU liaison and/or designated representative upon discovery. Unplanned releases include, spilling, spraying, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment or any chemicals, hazardous substances, hazardous materials, oils, or petroleum products. If the release originates from the Contractor's equipment, materials, chemicals, etc., the Contractor is also responsible for contacting the appropriate regulatory agencies and for remediating the release in accordance with all applicable federal, state and local laws, ordinances, orders and directives. NU will contact the appropriate regulatory agencies for any releases from NU's equipment, materials, chemicals, etc., and remediation will be performed by NU or its designated licensed Contractor. If the release is not caused by NU and the Contractor fails to fulfill its obligations, NU will notify the appropriate regulatory agency for the responsible Contractor and will bill the Contractor for NU's costs and expenses, including investigation and remediation costs and costs incurred by NU's Contractors.
3. Permits, Licenses and Certificates – The Contractor shall comply with all permit, license, and certificate requirements and laws, regulations, ordinances, and conditions of local, state and federal agencies.
4. Chemical Use and Disposal – The Contractor is responsible for ensuring safe and proper storage, use and/or disposal of all chemicals and hazardous materials, and to take precautions necessary to prevent exposure to other persons and/or properties. Use of environmentally friendly materials is preferred. Chemicals, fluids, and other hazardous materials transferred from their original containers must be placed in containers approved for their use. Unless otherwise directed in writing, disposal and removal of all such chemicals and materials is the responsibility of the Contractor. *Waste materials which are considered hazardous or otherwise regulated must not be disposed of on NU*

property. However, temporary storage location and removal should be coordinated with NU.

5. Environmental Management System Requirements – contractors, their subcontractors and agents must understand the actual and potential impacts of their jobs on the environment. Pre-job briefings conducted prior to the start of work shall include a review of NU's Environmental Policy and any environmental requirements, procedures or policies that are applicable to any component of the work to be performed.

Western Massachusetts Electric Company
Docket No. DTE 04-116

Record Request HD-01
Dated: 09/09/2005
Q- RR-008
Page 1 of 1

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

What specific training requirements, if any, should be considered by the Department for the groups mentioned in RR-DTE-007.

Response:

WMECO does not have any specific recommendations of training requirements that should be considered by the Department for any particular group of workers performing work on electric distribution systems. The Company believes the training programs and requirements it has for its employees meet all applicable requirements for our employees to perform this work, and additional guidance is not necessary. Outside contractors are responsible to provide the training for their workers, and provide documentation to the Company to that effect. The Company will ensure that electrical hazards associated with work on its electrical system are identified to the contractor before any work is performed.

Western Massachusetts Electric Company
Docket No. DTE 04-116

Record Request HD-01
Dated: 09/09/2005
Q- RR-009
Page 1 of 1

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Provide studies concerning the unsolvability of problem circuits down to the feeder level.

Response:

WMECO does not have any studies to reference concerning the "unsolvability" of problem circuits with respect to reliability improvements. WMECO does believe, however, that there are circuits that cannot be improved beyond a certain level of reliability. From an operational perspective, there are factors which have been described in previous data requests, that influence the reliability of a circuit that are out of the Company's direct control. Despite good utility practices, engineering, and common sense, factors such as terrain, circuit length, exposure to severe weather, etc., will have the greatest effect on reliability, and expenditures of large sums of money on reliability improvements will not improve reliability.

Western Massachusetts Electric Company
Docket No. DTE 04-116

Record Request HD-01
Dated: 09/09/2005
Q- RR-010
Page 1 of 1

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Please provide as a supplement to Information Request DTE-LDC-1-1, the distribution system losses at the time of the entire system peak at various voltage class levels, however low a voltage class level you can go.

Response:

As stated in the response to request DTE-LDC-01-001, WMECO does not directly measure or quantify line losses by voltage level. In its response WMECO provided an estimate that with an average annual loss factor of 6.18%, for 2004, the losses on the WMECO system at the hour of its peak would be approximately 46 MWs. WMECO cannot calculate the line loss, by voltage level, on its system without performing load flow studies on each of its approximately 250 circuits. This cannot be done with the present resources and technology available at the Company. Moreover, WMECO does not see any benefit to producing load flow studies for circuits operating well below their rated capacity.

Western Massachusetts Electric Company
Docket No. DTE 04-116

Record Request HD-01
Dated: 09/09/2005
Q- RR-011
Page 1 of 1

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Is any distribution project justified based on economics, particularly when savings in line losses are concerned?

Response:

WMECO cannot recall any distribution project in the past decade, or longer, that the Company justified solely on the basis of saving on line losses. The consideration of saving on line losses has been used only as part of the justification for doing some distribution projects. The distribution standards that WMECO uses incorporate designs that will reduce line losses compared to other design options. Reduction of line losses can help justify use of larger conductors, especially on circuit backbones.

Western Massachusetts Electric Company
Docket No. DTE 04-116

Record Request HD-01
Dated: 09/09/2005
Q- RR-012
Page 1 of 1

Witness: Michael T. Smith
Request from: Department of Telecommunications and Energy

Question:

Provide the gas companies' policies in terms of any independent audits or regulatory agencies of their pipelines for leaks.

Response:

This question is not applicable to WMECO.